PERGAMON

Progress in Surface Science 69 (2002) 165–191

Progress in SURFACE SCIENCE

www.elsevier.com/locate/progsurf

Author index for volumes 57–59

Volume 57

Bonnell, D.A. 187
Carraro, C. 61
Cole, M.W. 61
Davies, M.C. 95
Jerkiewicz, G. 137
Kleint, C. 253
Roberts, C.J. 95
Tendler, S.J.B. 95
Vansteenkiste, S.O. 95
Williams, P.M. 95
Woodruff, D.P. 1

Volume 58

Itaya, K. 121
Kumacheva, E. 75
Mizuno, S. 1
Over, H. 249
Tochihara, H. 1

Volume 59

Abdelrehim, I.M. 117
Ahner, J. 167
Akjouj, A. 255
Baldomir, D. 187
Bartelt, M.C. 67
Bartoš, I. 197
Beben, J. 343
Bertel, E. 207
Błaszczyszyn, R. 275
Bogicevic, A. 149
Brandbyge, M. 245

PII: S0079-6816(01)00043-0

Brzostowski, B. 277

Cadilhe, A.M. 67
Chan, C.T. 1
Che, J.G. 1
Czajka, R. 13

Davidson, S.G. 225
Deymier, P.A. 255
Di Bona, A. 91
Djafari Rouhani, B. 255
Dobrzynski, L. 255
Duś, R. 289

English, R.A. 225
Evans, J.W. 67

Flores, F. 233

Garfunkle, E. 103
Gomoyunova, M.V. 53
Goodman, D.W. 25
Goodman, F.O. 225
Green, M.L. 103
Gupta, A. 103
Gusev, E.P. 103
Gustafsson, T. 103

Hult, E. 149

Imbihl, R. 343
Inglesias, M. 187

Jenks, C.J. 67
Jurczyszyn, L. 13

Katrich, G.A. 355
Keister, J.W. 117
Kleint, C. 301
Kobayashi, N. 245
Kołodziej, J.J. 117
Kratzer, P. 135
Kucharczyk, R. 277
Kushwara, M.S. 255

Lai, X. 25
Langreth, D.C 149
Lau, M. 313
Lavernia, E.J. 313
Leung, T.C. 1

Levy Yayati, A. 233
Li, Y. 103
Loburets, A.T. 355
Łodziana, Z. 265
Lu, H.C. 103
Lundqvist, B.I. 149

Madey, T.E. 117
Melmed, A.J. 313
Mišcović, Z. L. 225
Młynarski P. 187
Mocuta, D. 167
Morgan, C.G. 135
Mróz, s. 323

Naumovets, A.G. 355
Nowicka, E. 289

Ortega, J. 233

Pelhos, K. 117
Pereiro, M. 187
Pérez, R. 233
Pronin, I.I. 53

Radoń, T. 331
Rafii-tabar, H. 13
Rowe, J.E. 117
Rutkowski, J.H. 79
Rydberg, H. 149

St. Clair, T.P. 25
Scheffler, M. 135
Srokowski, T. 265
Stęślicka, M. 277
Stoldt, C.R 67
Strömquist, J. 149
Suchorski, YU. 343

Tambakis, N.C. 313
Thiel, P.A. 67
Toby, S. 103
Tsong, T.T. 177
Tsukada, M. 245

Valden, M. 25
Vasseur, J.O. 255
Vedula, Yu.S. 355
Veleri, S. 91

Wojtczak, L. 79, 187

Yakovkin, I.N. 355
Yates, J.T., Jr. 167

Zemmouri, J. 255
Zieliński, P. 265

Subject index for volumes 57–59

Volume 57

Acetan, AFM 115
Adsorbate structures, X-ray standing wave absorption 1–60
Adsorption phenomena 121–3
AES *see* Auger electron spectroscopy
AFM *see* Atomic force microscopy
Al(1 1 1)
  atomic oxygen 10–11, 12, 19
  CH_3O 19, 26
  Na adsorption 12
  NaCl on 38
  Rb on 41
n-Alkanethiols 115
Alkylsilanes 115
Alkylthiols 115
Äona effect, Lilienfeld 277–87
Atomic force microscopy (AFM) 99–104
  acetan 115
  cell surfaces 117–18
  DNA 106–8
  dynamic processes 120
  Langmuir–Blodgett films 116–17
  molecular interactions 123–6
  polymers/biomaterials 119–23
  proteins 110–14
  self-assembled films 115
  thin organic films 115
  vanadates 223
Atomic structures, oxide surfaces 209–45
Auger electron spectroscopy (AES) 198, 218
Auger electrons, NIXSW 15–16
Auger emission peaks 44–5

Back reflection XSW (BRXSW) 6
Biodegradable polymers 121
Biomedical interfaces, scanning probe microscopy 95–136
Biomolecules, SPM 105–15
Born approximation 69–74
Bose–Einstein condensation 79
Bragg condition 5, 6, 45, 46
Bragg scattering, NIXSW 1–60
Bridge adsorption site 22
Bulk absorption profile 46, 47

Calcification, porin bioprosthesis 122–3
Casimir problem 86–7
Catalase, SPM 114
CdTe(1 1 0) 49
Cell surfaces, SPM 117–18
Chemical shifts, NIXSW 49–55
Coherent fractions, NIXSW 17–21, 32, 39
Coherent positions, NIXSW 17–21
Coincidence net structures 33–6
Constant current images 200
Constant height 199–200, 211
Contact lenses 122
Cryo-AFM 105, 110–11, 118
Crystallography 244–5
Cu, oxide surfaces 238–40
Cu(1 1 0), CH_3COO– 49–50
Cu(1 1 1)
  (2 × 2)-Rb 37
  ($\sqrt{3} \times \sqrt{3}$)R30°-Cl 37
  ($\sqrt{3} \times \sqrt{3}$)R30°-I 54
  Cl adsorption 43
  I adsorption 19
  NIXSW 5–6, 14
  PF_3 29–31
  Rb and Cl adsorption 37–9, 40–1
Cyclic voltammetry 157, 170

Darwin curve 3–4, 5, 7
Debye-Waller factor 20, 21, 31, 40, 68
Degradation mechanisms 121
Dipole approximation 52–3
Disordered structures 36–42
Distorted wave Born approximation (DWBA) 74–5
DNA, SPM 106–9

Dopant segregation 243
Dynamic processes, AFM 120

Elastic potential 87–8
Electrochemical adsorption isotherms 152–6
Electrochemical Langmuir isotherm 152
Electrochemical volcano relation 178–9
Electron spectroscopy for chemical analysis (ESCA) *see* X-ray photoelectron spectroscopy (XPS)
Electronic effect 207
ESDIAD 32

Fcc(1 1 1)
  alkali adsorption 41–2
  Hg adsorption 41–2
  low symmetry sites 21–6
  NIXSW 11, 19
Ferritin, AFM 112
Field effect transistor, Lilienfeld 292–7
Field emission, Lilienfeld 277–87
Fluorescence X-ray emission, NIXSW 15–16
Fourier Transform Infrared (FT-IR) 119
Friction force microscopy (FFM) 105
Frumkin isotherm 153–4, 163

GaAs, NIXSW 46
GaAs(0 0 1), S 1s photoemission 50
Gelatin films, SPM 119–20
Geometric effect 207
Gibbs energy 146, 147, 152, 154–5, 167–9
Green's function 76

H embrittlement 139
Hamiltonian, model atom-surface 64–9
Helium, hydrogen atom scattering 80–5
Hematite 227
HER *see* Hydrogen evolution reaction
Hexagonally packed intermediate (HPI) layers 109–10
Hilbert space 76
Hydration, biomaterials 123
Hydrogen atom scattering 80–5
Hydrogen chemisorption 140, 141–3
Hydrogen electroadsorption 143–67
Hydrogen evolution reaction (HER) 139, 144, 147, 151, 175, 176
Hydrogen interfacial transfer 167–75
Hydrogen physisorption 140, 141–3
Hydrogen sorption 137–86

Immunoglobulins, cryoAFM 110–11
Impedance mismatch 63
Impurity segregation 198
Incommensurate surface structures 36–42
InP(1 1 0) 47–8, 49
Interfacial transfer 176–7
Ir, H electroadsorption 148, 149
Ir(poly), hydrogen adsorption 157–61
Iron oxides, STM 227–30

Kapitza conductance 79

Langmuir–Blodgett films 116–17
Lateral force microscopy (LFM) 104, 105
LEED *see* Low energy electron diffraction
LFM *see* Lateral force microscopy
Lilienfeld, Julius Edgar, life and profession 253–328
Lilienfeld tube 263–8
Lippmann–Schwinger equation 76
Liquid crystals (LC) 115–16
Low energy electron diffraction (LEED) 40, 41, 157, 193
  atomic structures 209
  iron oxides 227
  perovskite 193, 220
  rutile 193
Low symmetry sites, NIXSW 21–6
Lysosomes, SPM 110

Maghemite 227
Magneli phases 197
Magnetic force microscopy (MFM) 105
Magnetic resonance force microscopy (MRFM) 105
Magnetite 227
Membranes, SPM 117–18
Metal adsorption 238–40
Metal-hydrides 139
MFM *see* Magnetic force microscopy
Model atom-surface Hamiltonian 64–9
Modification techniques 120–1
Molecular adsorbates, NIXSW 26–33
Molecular hydrogen pressure, overpotential 175
Molecular interactions 123–6
Molybdates 223–6
Monochromators, NIXSW 14
MRFM *see* Magnetic resonance force microscopy

Na_xWO_3 196
Near-edge X-ray absorption fine structure (NEXAFS) 27, 30–1
Near-field scanning optical microscopy (NSOM) 105
NEXAFS *see* Near-edge X-ray absorption fine structure
Ni(1 0 0) 35
Ni(1 1 1)
  $(5\sqrt{3} \times 2)$rect. -S 34–5, 43
  $c(2 \times 4)$-CO 19
  Cl adsorption 43
  Hg on 41
  K on 41
  PF_3 29–33
  PF_3, PF_2 and PF coadsorption 50–1
  SO_2 27–9
Non-dipole excitation 49–55
Nonmetallic adsorbates 241–3
Nonperturbative many-body effects 74–8
Normal-incidence XSW (NIXSW) 1–60
NSOM *see* Near-field scanning optical microscopy
Nucleic acids, SPM 106–9

Octadecyltrichlorosilane (OTS) 115
Overpotential, molecular hydrogen pressure 175
Overpotential deposition of H (ODP H) 144–8, 167–80
Oxide surfaces, STM and STS 187–252

Perovskites 189, 193–5, 217–21
PF_3 29–33, 50
Phase-imaging SFM 119
PhD *see* Scanned-energy mode photoelectron diffraction
Photoemission detection 49–55
Photon scanning tunnelling microscopy (PSTM) 105
Polyglucose, SPM 115
Polymer blends 121
Polymers, SPM 118–23
Polysaccharides, SPM 114–15
Porin bioprosthesis, calcification 122–3
Potential-stimulated adsorption-desorption (PSAD) 157
Proteins, SPM 109–14
PSTM *see* Photon scanning tunnelling microscopy
Pt(1 0 0), H electroadsorption 148–50
Pt(1 1 1)
  H electroadsorption 148–50, 157
  hydrogen adsorption 161–5
Pt(*h k l*) 161

Pt(poly)
  H electroadsorption 148–9
  hydrogen adsorption 157–61

Quantitative tunneling spectroscopy 204–6
Quantum reflection 61–93

RbCl(1 0 0) 38–9
RBS *see* Rutherford backscatter spectroscopy
Rb_xWO_3 196
Reduction, metal oxides 244–5
Reversible hydrogen electrode (RHE) 154–5
Rh, H electroadsorption 148, 149
Rh(poly), hydrogen adsorption 157–61
Ripplons 86, 89
RNA polymerase, SPM 108
Rocking curve width 5
Ruddleson Popper phases 197, 218
Rutherford backscatter spectroscopy (RBS) 218
Rutile 191–2, 210–17

SAM *see* Self-assembled monolayers
SBS *see* Site blocking species
Scanned-energy mode photoelectron diffraction (PhD) 31, 37, 41, 50
Scanning capacitance microscopy (SCM) 105
Scanning electrochemical microscopy (SEM) 105
Scanning force microscopy (SFM) 105
Scanning probe microscopy (SPM), biomedical interfaces 95–136
Scanning thermal microscopy (SThM) 105
Scanning tunneling microscopy (STM) 97, 98–9, 157, 187–252
  polysaccharides 114–15
  self-assembled films 115
Scanning tunneling spectroscopy (STS) 187–252
Schrödinger equation 70–1
SCM *see* Scanning capacitance microscopy
Secondary ion mass spectroscopy (SIMS) 119
Segregation, metal oxides 243–4
Self-segregation 198
Self-assembled monolayers (SAM) 115–16
SEM *see* Scanning electrochemical microscopy
Semiconductors
  III–V 46–9
  XSW 5
SEXAFS *see* Surface extended X-ray absorption fine structure
SFM *see* Scanning force microscopy

Si(1 1 1)
  (7 × 7) 45, 49, 201
  Pb on 40
  ($\sqrt{3} \times \sqrt{3}$)R30° 49
Si, XSW 21
Signal-to-noise ratio, NIXSW 16
SIMS *see* Secondary ion mass spectroscopy
Site blocking species (SBS) 176–7
Space charged induced segregation 198
Spatial resolution limits, oxides 203–4
Spinels 189
SPM *see* Scanning probe microscopy
$SrTiO_3$ 190–252
Standard hydrogen electrode (SHE) 154
SThM *see* Scanning thermal microscopy
Sticking coefficient, ultralow energy 61–93
STM *see* Scanning tunneling microscopy
Streptavidin-biotin 123
STS *see* Scanning tunneling spectroscopy
Surface extended X-ray absorption fine structure (SEXAFS) 14, 15, 21, 27, 42, 44
Surface force microscope (SFM) 122
Surface mesh structures 33
Surface plasmon resonance (SPR) 122
Surface X-ray diffraction (SXRD) 36

Temkin isotherm 152–3
Thermal vibrations, NIXSW 20
Thermodynamics, H electroadsorption 151–65
Thin organic films, SPM 115–17
III–V semiconductors, NIXSW 46–9
TiO_2 190–252
  1 × 1 211, 212
  1 × 2 212, 214
  1 × 3 216
  2 × 2 212
  3 × 2 214
  Na adsorption 241
  STM and STS 189
Tip electronic structure, STM 201–2
Transition metal oxide surfaces, STM and STS 187–252
Tungstates 223–6
Tungsten bronzes 196, 223–6

Ultralow energy, sticking coefficient 61–93
Under-potential deposition of H (UDP H) 144–8, 157, 159, 160–80

Van der Waals potential 72, 84–5
Vanadates 221–3
Variable current images 200
Volmer–Heyrovsky pathway 144, 147
Volmer–Tafel mechanism 144, 147

Water electrolysis 140
Wentzel Kramers Brillouin (WKB) 68–9, 72
Wustite 227

X-ray diffraction (XRD) 18
X-ray emission, NIXSW 15–16
X-ray photoelectron spectroscopy (XPS) 49, 118–19, 198
X-ray standing wavefield absorption (XSW) 1–60
X-rays, Lilienfeld 263–8
XSW *see* X-ray standing wavefield absorption

Volume 58

Activated complexes 312–20
  on metal surfaces 312–20
Adhesion 90–6
Adparticles
  coadsorption interactions 309–54
  single adsorption interactions 254–309
ADPB *see* Anti-phase domain boundries
Adsorption
  see also Coadsorption; Coadsorption
  alkali metals 255–68
  aromatic molecules 173–90
  atomic nitrogen 306–8
  $CO/N_2/NO$ 283–94
  coverage dependent changes 254–309
  halogens 308–9
  hydrogen 301–6
  iodine modified electrodes 159–73
  organic molecules 159–190
  oxygen 268–283
  polymers 103–7
  sulfur 295–301
Ag(0 0 1), reconstructive AM adsorption 13–16, 34–5, 41–2
Ag(1 0 0), anodic dissolution 202–206
Ag(1 1 0), reconstructive AM adsorption 47
Ag(1 1 1)
  anion adsorption 144
  iodine adsorption 128–9, 130–5

non-reconstructive AM adsorption 258–9
TMPyP adsorption 165–6
Ag
electrode surface preparation 126–8
underpotential deposition 149–55
Al(0 0 1), reconstructive AM adsorption 20–2
Al(1 0 0), reconstructive AM adsorption 268
Al(1 1 1)
mixed alkali metal overlayers 352–3
non-reconstructive AM adsorption 258–9
reconstructive AM adsorption 58–64, 268
Alkali metals (AM)
CO coadsorption 321–29
coverage dependent adsorption changes 255–68
mixed overlayers 352–3
non-reconstructive adsorption 258–65
oxygen coadsorption 343–50
reconstructive adsorption 1–74, 265–8
water coadsorption 335–6
Anion adsorption, STM studies 128–44
Anisotropic etching 200–2
Anodic dissolution 190–214
Anthracene, adsorption on electrodes 185, 186–7, 189–90
Anti-phase domain boundries (APDB) 50–1
Aromatic molecules, adsorption on electrodes 173–90
Au(0 0 1), reconstructive AM adsorption 16–19
Au(1 1 0), reconstructive AM adsorption 48–51
Au(1 1 1)
Ag adlayers 149–52
anion adsorption 144
anodic dissolution 212
Cu adlayers 145–7
Hg adlayers 155–7
iodine adsorption 128–9, 130–5
organic molecule adsorption 171–73
sulfate/bisulfate adsorption 135–6, 138–41
TMPyP adsorption 159–165
Au, electrode surface preparation 126–8

Benzene
adsorption on electrodes 174–82, 186–8
coadsorption with electronegative molecules 329–35
4,4′-Bis(*N*-methyl-pyridinium)-*p*-phenylenedivinylene (PPV) 172–3
Bond behaviour, CO/NO adsorption on transition metals 284–5
Bromide, adsorption on electrodes 144

Buckling substrate, alkali metal adsorption 261, 263
Byphenyl, adsorption on electrodes 185–6

C_{60} *see* Fullerine
Carbon monoxide
  adsorption on metal surfaces 283–94
  alkali metals coadsorption 321–29
  benzene coadsorption 332–4
  catalytic oxidation 309–11, 312–20
Catalysis, coadsorption on metals 309–54
  interacting adparticles 249–376
  oxygen reduction 157
Charge transfer type interactions, CO-AM coadsorption 321
Chemisorption *see* Adsorption; Coadsorption
Cl, Mg/Rb coadsorption 351–2
Clavilier, J. 126–7
Co(0 0 0 1), anodic dissolution 213–14
Co, electrode surface preparation 128
Coadsorption systems
  activated complexes at metal surfaces 312–21
  adspecies interations 309–54
  compound formation 344–54
  modifier action 321–343
Composite double-layer ordered surface-alloy 63
Composite surface structure (CSS) 1–74
Compound formation, coadsorption on metals 344–54
Confined polymeric fluids 103
Couette flow geometry 88
Critical shear stress 99–100
Crystal violet *see* Hexamethylpararosaniline
Crystallography
  interacting adparticles 249–376
  technique comparison 252–3, 359
Cs, oxygen coadsorption 343–49
CSS *see* Composite surface structure
Cu(0 0 1), reconstructive adsorption 7–13, 19, 22–34, 268
Cu(1 0 0), anodic dissolution 211–212
Cu(1 1 0)
  oxygen adsorption 277–81
  reconstructive AM adsorption 47–8, 51–7, 265–7
Cu(1 1 1)
  anion adsorption 144
  aromatic molecule adsorption 186–90
  reconstructive AM adsorption 64–9, 268

Cu
  electrode surface preparation 128
  underpotential deposition 145–9
CV *see* Cyclic voltammograms
Cyanide, adsorption on electrodes 141–3
Cyclic voltammograms (CV) 126–7, 145–6, 148, 150–3, 155

Data analysis, Surface Force Apparatus (SFA) 87–91
Dry surfaces, interfacial friction 92–3

ECALE *see* Electrochemical atomic layer epitaxy
Elecrostatic interactions, adsorbed alkali metals 255, 256–8, 264–5
Electrochemical atomic layer epitaxy (ECALE) 157
Electrochemical dissolution, semiconductors 214–35
Electrochemical etching method 128
Electrode–electrolyte interface 121–47
Electrodes, surfaces preparation 126–8
Electrolyte solutions
  scanning tunneling microscopy 121–47
  sliding surfaces 93, 103
Electronegative species, coadsorption 341–2
Electronic interactions, coadsorption of electronegative species 341
End-tethered polymers, shear properties 103–7
Etching
  anisotropic 200–2
  electrochemical 128, 214–35

Face-centered cubic (fcc) metals
  (0 0 1) 5–45
  (1 1 0) 45–58
  (1 1 1) 58–69, 258, 271
  reconstructive AM adsorption 1–74
Fe
  see also Iron oxide; Iron oxide
  electrode surface preparation 128
Flame-annealing and quenching method 126–7
Fluorocarbons, friction 93–6
Friction
  aqueous electrolyte solutions 93, 103
  confined polymeric fluids 103–12
  dry mica surfaces 92–3
  interfacial 75–120
  liquid crystals 112–14
  surfaces in molecular contact 93–6
  types 78–9
Fullerine (C_{60}) 96

GaAs, electrochemical dissolution 229–33

Halogens, adsorption on metal surfaces 308–9
HCL, Cu(1 0 0) anodic dissolution 211–212
Hcp *see* Hexagonal close packed
Hexagonal close packed (hcp) metals, (0 0 0 1) 258, 271
Hexamethylpararosaniline (crystal violet) 171–2
Hg, underpotential deposition 155–7
High-resolution electron energy loss spectroscopy (HREELs) 61, 359
Humidity, interfacial friction 93
Hydrocarbons, friction 93–6
Hydrogen, adsorption on metal surfaces 301–6

In situ scanning tunneling microscopy (STM), electrodes 121–47
InP, electrochemical dissolution 233–5
Interfacial friction 75–120
Iodine
  adlayer structure 129–35, 167–8
  modified electrodes 159–73, 202–211
Iodine–CO replacement technique 128
Ionic bonding, alkali metal adsorption 256–8, 260, 264–5
Ir, electrode surface preparation 126–8
Iron oxide films 350

KVV Auger transition, Li adatoms 10

Langmuir–Blodgett polymers 93–6
Langmuir–Hinshelwood mechanism 309–10
Large molecules, coadsorbate induced reorientation 340–1
LEED *see* Low-energy electron diffraction
Liquid crystals, shear properties 112–14
Liquids
  interface with solids 121–47
  thin layers 93, 97–103
Low-energy electron diffraction (LEED)
  electrode surfaces 128–35, 140–2, 148–52, 154–5
  reconstructive adsorption 7–70
Lubrication
  electrolyte solutions 93, 103
  liquid crystals 112–14
  polymeric fluids 103–12
  simple liquids 97–103

Metal films 255
Metals
  see also Alkali metals; Alkali metals
  fcc 5–69, 258, 271
  hcp 258, 271

$MgCl_2$ films 351–2
Mica, surface force apparatus 79, 92–3
Missing row reconstruction
  alkali metal adsorption 6–19, 41–3, 45–6, 265–7
  oxygen adsorption 276–7, 281–3
Modifiers, CO-AM coadsorption 321–29

Na, sulfur coadsorption 353–4
Naphthalene, adsorption on electrodes 182–4, 186–7, 188–9
Naphthalene-dicarboxilicacid-anhydride (NDCA) 340–1
Naphthoquinone (NQ), adsorption on electrodes 184
NDCA *see* Naphthalene-dicarboxilicacid-anhydride
NH_3, NO coadsorption 320–1
Ni(0 0 1), reconstructive AM adsorption 35–41, 42–6
Ni(1 0 0)
  Na–S coadsorption 353–4
  oxygen adsorption 274–5
  potassium–nitrogen coadsorption 339–40
Ni(1 1 0)
  oxygen adsorption 278–9
  reconstructive AM adsorption 46–7
Ni(1 1 1)
  anodic dissolution 190–202
  benzene adsorption 331
  CO–O coadsorption 313, 318
Ni, electrode surface preparation 128
Nitrogen
  adsorption on metal surfaces 283–4, 285–6, 306–8
  oxygen coadsorption 318–20, 337–9
  potassium coadsorption 339–40
NO
  adsorption on metal surfaces 283, 285, 291–4
  benzene coadsorption 334–5
  NH_3 coadsorption 320–1
Non-adsorbed polymers, shear properties 107–8

Organic molecule adsorption
  bare electrodes 173–90
  iodine modified electrodes 159–73
Oxygen
  alkali metals coadsorption 343–50
  benzene coadsorption 334–5
  CO catalytic oxidation 309–11, 312–20
  coverage dependent adsorption changes 268–283
  Fe coadsorption 350–1

N_2 coadsorption 318–20
nitrogen coadsorption 337–9
non-reconstructive adsorption 269–76
reconstructive adsorption 276–83

Pauling radii, alkali metal adsorption 257, 260
Pd(1 0 0), anodic dissolution 206–211
Pd(1 1 0), anodic dissolution 206–8, 210–11
Pd(1 1 1)
anodic dissolution 206–210
CO–O coadsorption 317–8
non-reconstructive AM adsorption 258–9
Pd, electrode surface preparation 126–8
Polymer melts, shear properties 108–12
Polymer monolayers, shear properties 93–6
Polymeric fluids, shear properties 103–12
Porphorine *see* 5,10,15,20-tetrakis(*N*-methylpyridinium-4-yl)-21H, 23H-porphorine (TMPyP)
Potassium, nitrogen coadsorption 339–40
PPV *see* 4,4′-bis(*N*-methyl-pyridinium)-*p*-phenylenedivinylene
PPV *see* 4,4′-bis(*N*-methyl-pyridinium)-*p*-phenylenedivinylene
Pt(1 0 0)
iron oxide films 351
TMPyP adsorption 167–71
Pt(1 1 0)
CO adsorption 289–92
NO adsorption 294
Pt(1 1 1)
Ag adlayers 152–5
anion adsorption 144
benzene adsorption 174–5, 180–2, 331–2
CO–O coadsorption 313, 317
Cu adlayers 147–9
cyanide adsorption 141–3
iodine adsorption 129–30
iron oxide films 350
naphthalene adsorption 182–4
oxygen adsorption 269–70
sulfate/bisulfate adsorption 136, 138–41
TMPyP adsorption 166–7
Pt, electrode surface preparation 126–8

Rb, Cl coadsorption 352
Re(0 0 0 1), Sulfur adsorption 297–8, 298–9
Reynold's lubrication geometry 88

Rh(1 1 0), oxygen adsorption 281–3
Rh(1 1 1)
  anion adsorption 144
  benzene adsorption 174–80
  CO–O coadsorption 313, 315, 316–17
  naphthalene adsorption 182–4
  non-reconstructive AM adsorption 258–9
  oxygen adsorption 272
  sulfate/bisulfate adsorption 136–41
  sulfur adsorption 300–1
  TMPyP adsorption 166–7
Rh, electrode surface preparation 126–8
Ru(0 0 0 1)
  benzene adsorption 332
  CO–Cs coadsorption 323–29
  CO–O coadsorption 313–16
  N_2–O coadsorption 318–20
  NO adsorption 293–4
  non-reconstructive AM adsorption 258–9
  oxygen adsorption 270–3
  Ru(1 0 1 0), oxygen adsorption 275–6

SAS structures *see* 'Substitutional atoms and adatoms on substrate islands' stuctures
Scanning tunneling microscopy (STM)
  AM adsorption 12–13, 31–4, 48, 50, 61
  electrodes 121–47
  principles 125–6, 252–3
Semiconductors, electrochemical dissolution 214–35
SEXAFS *see* Surface extended X-ray-absorption fine-structure
Shear studies, Surface Force Apparatus 75–120
Si(0 0 1), electrochemical dissolution 226–9
Si(1 1 0), electrochemical dissolution 221–6
Si(1 1 1), electrochemical dissolution 215–21
Solid–liquid interfaces, scanning tunneling microscopy 121–47
SSD *see* Surface structural database
Stick-slip motion 89–90, 100–3
STM *see* Scanning tunneling microscopy
'Substitutional atoms and adatoms on substrate islands' (SAS) stuctures 22–3, 34–41, 44–5, 55–8, 64
Substitutional structures, AM adsorption 20–2, 59–62
Sulfate/bisulfate, adsorption on electrodes 135–41
Sulfur
  adsorption 295–301
  modified Ni, anodic dissolution 194–202
  Na coadsorption 353–4

Surface extended X-ray-absorption fine-structure (SEXAFS) 59
Surface Force Apparatus (SFA) 75–120
  data analysis 87–91
  design 79–87
  shear and friction studies 91–115
Surface forces balance technique 79–81
Surface ordered alloys 1–74
Surface structural database (SSD) 253
Surface X-ray scattering technique 147

Ternary surface alloys 352–3
5,10,15,20-Tetrakis(*N*-methylpyridinium-4-yl)-21H, 23H-porphorine (TMPyP) 159–71

UHV-EC *see* Ultrahigh vacuum-electrochemical
Ultra-thin compound films 350–4
Ultra-thin metal films 255
Ultrahigh vacuum-electrochemical (UHV-EC) system 128
Underpotential deposition (UPD) 144–58

Water
  alkali metals coadsorption 335–6
  sliding surfaces 93, 103

Zr(0 0 0 1), oxygen adsorption 273–4

Volume 59

2D islands, metal homoepitaxy 69
Acetylene 117
Admetal films, annealing behaviour 122
Admolecule dynamics 167–175
AE *see* Alkaline earths
AED *see* Auger electron diffraction
AES *see* Auger electron spectroscopy
AFM *see* Atomic force microscopy
Ag adsorption 6
Ag/Ag(1 0 0) 70–74
Ag/Si(1 1 0)-system imaging, near-surface atomic structures 61
Ag/Si(1 1 1)-system imaging, near-surface atomic structures 59
Ag/TiO_2(1 1 0) clusters 41
Al distribution, Fe–Al alloy impurities 321
Al growth, homoepitaxy 154
Al(111) 163
  atom bridges 248
  transmission eigenchannels 245
Alkaline-earth (AE), overlayers on furrowed transition metal surfaces 355–365

Ammonia *see* NH_3
Anharmonic surface dynamics 265–274
Anisotropy profile, modulated electron emission 96
APFIM *see* Atom probe field ion microscopy
Atom bridges 245–250
Atom probe field ion microscopy 313–321
Atomic force microscopy (AFM) 14–15
Au/W(2 1 1) film growth 117
Au adsorption 6
Au(1 1 1)
  mesoscopic pattern formation 213
  Shockley surface state 220
AuCu alloys via AES 323–330
Au/TiO_2(1 1 0)
  cluster growth 31
  electronic cluster structure 44
Auger electron diffraction (AED) 53, 91
Auger electron spectroscopy (AES) 27, 118, 323, 324
Auger peak heights (APH) 323

Backscattering electrons, forward focussed 55
Band structures 331
Bifurcation, CO oxidation of Pt 345
Blume–Emery–Griffiths model 84
Boltzmann's transport equation 190
Boundary conditions, giant magnetoresistance (GMR) 191

Chemical bond hopping 177
Chemisorption, precursor trapping 168
CO oxidation of Pt 343–354
CO/Cu(1 1 0), dynamic behaviour of admolecules 167
Computation, nano-science 18
Conductivity, giant magnetoresistance (GMR) 193
Continuum models, electron transmission through atom bridges 246
Corrugated-iron pattern formation 214
Crystals
  electron structure via VLEED 197–206
  harmonic 265
  quantitative phase analysis 53
Cu adsorption 6
Cu(1 1 0), dynamic behaviour of admolecules 167
Cu(1 1 0)/O-p(2x1), mesoscopic pattern formation 210

δ-doped superlattices (SL) 277–287
Dangling bond surface states 223
Data interpretation, surface melting 85

Decomposition rate law, N_2O 111
Degrees of freedom (DOF) 266
Dense condensed matter, van der Waals interactions 153
Density functional theory (DFT) 135, 149, 151, 194, 197
Density of states (DOS) 197, 245, 331
DFT *see* Density functional theory
Diffusion mediated transfer 67
Diffusion of O_2 and H on Si(1 1 1)-7 × 7 surfaces 177–186
Directional auger electron spectroscopy *see* PDMEE
DOF *see* Degrees of freedom
DOS *see* Density of states
Duffing oscillator 265
Dynamic behaviour of admolecules, measurement 167
Dynamic experiments, H segregation on PdH 292
Dynamics, anharmonic surfaces 265–274

Eigenchannels 245
Electric giant stop bands 262
Electrified semiconductors 225–232
Electron
  backscattering, forward focussed 55
  correlation effects, semiconductor surfaces 233–243
  energy distribution, modulated electron emission 92
  lifetimes 203
  reflectivity and band structure 199
  structure of crystals via VLEED 197–206
  transmission through atom bridges 245
Electron stimulated desorption ion angular distribution (ESDIAD) 31, 167
Electron-atom scattering 93
Electronic structure
  metal clusters on TiO_2(1 1 0) 44–48
  surface self-structuring 207
Equations of motion (EOM) 266
ESDIAD *see* Electron stimulated desorption ion angular distribution
ESTM *see* Extensive scanning tunnelling microscopy
Extensive scanning tunnelling microscopy (ESTM) 67–72

Faceting, overlayer-induced 1–11
Fe–Al alloy impurities, APFIM study 313–321
FEM *see* Field electron microscopy
Field electron microscopy (FEM), CO oxidation of Pt 343
Field ion microscopy (FIM)
  CO oxidation of Pt 344
  imaging 315
  Si surface chemistry 177

FIM *see* Field ion microscopy
Formation rate law, NO 113
Forward focussed backscattering electrons
  near-surface atomic structure 53–65
  pattern formation mechanism 54
Furrowed transition metal surface, electronic structure 356

Ga
  adsorption energies 139
  surface diffusion 141
GaAs(0 0 1)
  deposition and desorption 138
  growth theory 135–147
  surface structures 137
Gear integrator code 104
Generalised gradient approximation (GGA) 151
GGA *see* Generalised gradient approximation
Giant stop bands, waveguides 255–264
GMR *see* Giant magnetoresistance
Grain boundary compositions, Fe–Al alloy impurities 318
Guericke, O. 303–307

H
  chemical bond hopping 181
  segregation on PdH, dynamic experiments 292
Hamiltonians, 2D Hubbard 236, 239
HAS *see* Helium atom scattering
Helium atom scattering (HAS) 173
Herring-bone pattern formation 213
Homoepitaxy 69, 154

IADs *see* Intensity angular distributions
Inelastic mean free path (IMFP) 324
Intensity angular distributions (IADs) 91–101
Interfaces
  giant magnetoresistance 187–196
  modulated electron emission 91–101
Ising type model 79
Islands
  growth 135
  kinetic pathways 67
Isothermal desorption experiments, H segregation on PdH 292

Keldysh Green function method 13
Kikuchi bands 57
Kronig–Penney model, semi-infinite δ-doped superlattices (SL) 278

Lateral momentum distribution, dynamic behaviour of admolecules 171
LDA *see* Local-density approximation
LDOS *see* Local density of states
LEED *see* Low energy electron diffraction
LEIS *see* Low energy ion scattering
Librational energy 167
Local density of states (LDOS) 246
Local-density approximation (LDA) 135, 150, 197, 223, 234, 238
Low energy electron diffraction (LEED) 79, 118, 123, 197, 207
Low energy ion scattering (LEIS) 323

Magnetic force microscopy (MFM) 17
MBE growth 135
MD *see* Molecular dynamics
Mélclewski, Prof. R., biographical note 275
Medium energy ion scattering (MEIS) 81
MEIS *see* Medium energy ion scattering
Mesoscopic self-structuring on metal surfaces 207–223
Metal clusters
  $Ag/TiO_2(1\ 1\ 0)$ 41
  $Al/TiO_2(1\ 1\ 0)$ 41
  $Au/TiO_2(1\ 1\ 0)$ 31, 44
  $Pd/TiO_2(1\ 1\ 0)$ 40, 47
  size 31
  $TiO_2(1\ 1\ 0)$ substrate 31
Metal homoepitaxy, 2D islands 69
Metal surfaces
  mesoscopic self-structuring 207–223
  optical excitation 331
Metallisation, alkaline-earth overlayers 360
MFM *see* Magnetic force microscopy
Mo(1 1 1) 2, 53
  Wulff plot 4
Mo(1 1 2) electronic structure 356
Models
  Blume–Emery–Griffiths 84
  continuum 246
  Ising type 79
  Kronig-Penney 278
  phenomenological 58
Modulated electron emission 91–101
Molecular dynamics (MD) simulations 13–23
Monte Carlo (MC) simulations 68, 144, 323

N_2O gas phase kinetics 103–115
Na transmission eigenchannels 245

Nano-physics
  computation 18
  SPM and MD 13–23
Nanocrystalline Fe–Al alloy 313
Near-surface atomic structure 53–65
NH_3/Cu(1 1 0), dynamic behaviour of admolecules 167
Nonmetal-to-metal transition (NMT) 355
Nucleation
  2D islands in metal homoepitaxy 69
island growth, GaAs growth theory 142

O_2 chemical bond hopping 179
O/Cu(1 1 0)/O-p(2 × 1) Shockley surface state 216
O/Pt(1 1 1) 149
One-dimensional waveguide 255
Overlayer-induced faceting 1–11
Oxygen, N_2O gas phase kinetics 103
Oxynitridation 103

Pattern formation 54, 210–214
PD *see* photoelectron diffraction
Pd/H
  hydrogen segregation 289–300
  surface interaction 293
Pd/TiO_2(1 1 0) clusters 40–47
Pd/W(2 1 1)
  catalytic properties 131
  film growth 120
Pd/W alloy formation, ultrathin films on W(2 1 1) 126
PDMEE *see* Primary-beam diffraction modulated electron emission
Phase transitions, alkaline-earth overlayers 362
Phenomenological model, near-surface atomic structure 58
Photoelectron diffraction (PD) 91
Photoelectrons, energy distribution 340
Photofield emission spectroscopy 331–342
Photonic crystals 255
Photonic giant stop bands 257
Planes, local fluctuations 343
Potential energy surface 135
Primary-beam diffraction modulated electron emission (PDMEE) 91
Pseudospin models, surface melting 79, 84
Pt(1 0 0), CO oxidation 343–354
Pt (1 1 0) mesoscopic pattern formation 214
Pt/W(2 1 1) film growth 120
Pyramidal facets 2, 117

QCM *see* Quartz crystal microbalance technique
QENS *see* Quasi-elastic neutron scattering
Quartz crystal microbalance technique (QCM) 119
Quasi-elastic neutron scattering (QENS) 79
Quasi-stark-ladder (QSL) distribution 227

Real-time imaging, near-surface atomic structure 62
Recursion-transfer matrix (RTM) 246
Recursive-Green-function (RGF), electrified semiconductors 225
RGF *see* Recursive-Green-function
RHEED, GaAs growth theory 144
RKKY *see* Ruderman–Kittel–Kasuya–Yosida interaction
Roughness characteristics, giant magnetoresistance (GMR) 191
RTM *see* Recursion-transfer matrix
Ruderman–Kittel–Kasuya–Yosida interaction (RKKY) 187, 194

Scanning probe microscopy (SPM) 13–23
Scanning tunnelling microscopy (STM)
  GaAs growth theory 136, 142
  metal clusters on TiO_2 25–52
  nano-physics 14–22
  self-structuring of surfaces 214
  Si surface chemistry 178
  transmission through atom bridges 245
  2D islands in metal homoepitaxy 68
Scanning tunnelling spectroscopy (STS) 25, 207
SDOS *see* Surface density of states
Self-structuring on surfaces 207–223
Semi-infinite superlattices (SL) 277
Semiconductors 103, 225–232, 233, 277
Shockley surface state, one-dimensional confinement 216
Si surface chemistry 103–115
Si(1 0 0) 53
Si(1 1 1)-5 × 5
  2D extended Hubbard Hamiltonian 236
  correlated surface bands 237
  LDA calculations 234
Si(111)-7 × 7
  2D extended Hubbard Hamiltonian 239
  correlated surface bands 239
  H diffusion 181
  LDA calculations 238
  O_2 diffusion 178
Silicon oxynitride films 103
Single-scattering cluster (SSC) theory 53–65, 91

SL *see* Superlattices
SL miniband structure, δ-doped superlattices (SL) 283
Sn/Ge(1 1 1)-3 × 3, electron correlation effects 240
Snowflakes, van der Waals interactions 150
Soft X-ray photoelectron spectroscopy (SXPS) 117, 118
Spin-polarisability low-energy electron diffraction (SPLEED) 192
SPLEED *see* Spin-polarisability low-energy electron diffraction
SPM *see* Scanning probe microscopy
Static experiments, H segregation on PdH 291
Step-flow growth mode, GaAs growth theory 144
STM *see* Scanning tunnelling microscopy
Stranski–Krastanov growth modes 1
Stress, self-structuring on surfaces 208
Striped domain phase pattern formation 210
STS *see* Scanning tunnelling spectroscopy
Superlattices (SL) 187, 255
  δ-doped 277–287
  miniband tailoring 277
Surface density of states (SDOS)
  cystal electronic structure 197
  electrified semiconductors 225
  photofield emission spectroscopy 338
Surface diffusion, alkaline-earth overlayers 362
Surface electronic characteristics
  δ-doped superlattices (SL) 277–287
  electrified semiconductors 231
Surface energy 1–2
Surface image plane (SIP) 289
Surface melting 79–89
Surface photoyield 360
Surface property tailoring, alkaline-earth overlayers 355–365
Surface states
  δ-doped superlattices (SL) 278
  electrified semiconductors 225–232
  mesoscopic self-structuring on metal surfaces 216
  Surface stress, self structuring on surfaces 208
  SXPS *see* Soft X-ray photoelectron spectroscopy

Target current spectroscopy (TCS) 197, 200, 202
TCS *see* Target current spectroscopy
Temperature programmed desorption (TPD) spectroscopy 117, 122, 169
Thermal desorption mass spectrometry (TDMS) 290
Thermally activated processes, ultrathin films on W(211) 122
Time-of-flight electron stimulated desorption ion angular distribution (TOF-ESD-IAD) 171

TiO_2(1 1 0)
  morphology 28
  supported nanoclusters, scanning tunnelling microscopy (STM) 25–52
TOF-ESDIAD *see* Time-of-flight electron stimulated desorption ion angular distribution
TPD *see* Temperature programmed desorption spectroscopy
Transmission eigenchannels 245
  2D islands in metal homoepitaxy 66–77

Ultrahigh vacuum (UHV) 27
Ultrathin films 53–65, 103, 119
Unoccupied electron states, crystals via VLEED 198

Vacuum physics, history 301–312
Van der Waals
  density functions 156
  interactions at surfaces 149–165
  potentials, surface melting 83
Very low energy electron diffraction (VLEED) 197
VLEED *see* Very low energy electron diffraction

W(2 1 1), ultrathin films, annealing behaviour 122
Waveguide, one dimensional 255
Wulff plot 4